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How to Evaluate the "Financial Maturity" of Timber

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If you own merchantable timber, you face an important question on a continuing basis: "Should I sell my timber now or should I wait?" How you respond to this question involves many issues, of course, including stand conditions, site conditions, and other physical and biological considerations. For many landowners, however, financial considerations are also extremely important. In this article we discuss "financial maturity" as a specific tool that can be used to help evaluate timber harvest decisions.

When is Timber "Financially Mature?"

"Financial maturity" occurs when the annual rate of increase in monetary value for a forested property falls below what the owner considers an acceptable rate of return. The comparison is simple:

Annual Rate of Value Increase Projected for a Forested Property vs. Your "Guiding Rate" or "Hurdle Rate" of Return for that Property

If the annual rate of value growth of a forested property doesn't match your rate of return—sometimes called the "hurdle rate" or "guiding rate"—your timber is "mature," or ready for harvest, from a financial standpoint. To evaluate the financial maturity of a tract of timber you therefore need two numbers—the projected annual rate of value increase for the tract, and the hurdle rate.

The Projected Rate of Value Increase, or Forest Value Growth Percent

The annual rate of increase in value

for a forested property, sometimes called the "Forest Value Growth percent (FVG%)" can be calculated if you know the property's current value and if you can estimate the property's projected value at a specific time in the future. Many landowners use one year, five years, or ten years as the length of time considered.

To calculate the FVG% projected for a specific tract of timber over a specific time period (a period of "n" years), a simple formula can be used that is based on the formula for compound interest.

$$FVG\% = \left[\frac{\text{Projected Land and Timber value in "n" years}}{\text{Current Land and Timber Value}} \right]^{1/n} - 1$$

Example 1. FVG% for a one-year period. A forested property with a land and timber value of \$90,000 today and a projected total value of \$100,000 one year from today has a projected rate of value increase just over 11%:

$$FVG\% = \left[\frac{\$100,000}{\$90,000} \right] - 1 = .1111, \text{ or about } 11.1\%$$

For a one-year time period, note that the formula is somewhat simplified—the 1/n factor is 1/1, so this part of the formula has no impact on the result.

Example 2. FVG% for a five-year period. If the land and timber are valued at \$90,000 today, and if you've estimated the tract will have a value of \$120,000 in five years, the projected rate of value increase is just over 5.9% per year:

$$FVG\% = \left[\frac{\$120,000}{\$90,000} \right]^{1/5} - 1 = .0592, \text{ or about } 5.9\%$$

Using the formula involves raising a number to a fractional "power." (This can be done using a hand-held calculator with y (x) key.) In this example the exponent or "power" is 1/5 = .2.

The rate of value increase projected for a forested property will depend on:

- ◆ Projected growth of the timber
- ◆ Potential changes in product class of the timber (for example, some trees may grow from pulpwood to higher valued size classes like sawtimber)
- ◆ Current and projected timber prices
- ◆ Current and projected land values

These factors are specific to the stand of timber, the site, and other physical and biological factors, and they also depend on your expectations of market factors that will impact land and timber prices in the future.

The Hurdle Rate

To evaluate the financial maturity of your timber, you compare the projected value increase for the forested property with the "hurdle rate"—the compound rate of interest that you would consider minimally acceptable for your investment in that particular tract of land and timber. When choosing a hurdle rate, sometimes called a "guiding rate" or an "alternative rate of return," two considerations are extremely important: the alternative uses of your capital, and true comparability of the interest rates.

Alternative uses of your capital. What would you do with the money if you sold your timber now? Would you save it, use it to repay loans, or spend it?

◆ **Save it.** If you plan to save the money from your timber sale, your alternative rate of return is based on the interest rate you expect to earn in the bank accounts, mutual funds, certificates of deposit, or other savings alternatives you plan to use.

◆ **Use it to repay loans.** If you plan to use the money from your timber sale to repay loans, your alternative rate of return should be based on the average annual interest rate you're paying on the loan accounts.

◆ **Spend it.** If you plan to spend the money from a potential timber sale, say to buy a new car or to remodel your home, your alternative rate of return can be based on the rate of interest you would pay on the car loan or the remodeling loan if the timber sale isn't made. That is, your hurdle rate may be determined by the rate of interest you would pay on borrowed funds if you don't harvest timber.

True comparability of the interest rates. The annual rate of value increase calculated for your forested property (FVG%) and the hurdle rate of return should be comparable in terms of taxes, inflation, potential risk, investment liquidity, and in any other way that is important to you as a decision maker.

If you calculated FVG% on a before-tax basis, be sure to use a before-tax hurdle rate. Similarly, if your projected timber value was estimated using today's timber prices (multiplied by the projected timber volume), then your FVG% estimate is in "real" or "constant dollar" terms—it's an uninflated rate of return estimate and it should not be compared to loan rates or bank rates until an adjustment is made for the rate of inflation. (See Bullard and Gunter 2000 for accurate methods to adjust interest rates for income taxes and inflation.)

Landowners should also consider the riskiness of projected forest value increases versus the riskiness of investment alternatives, as well as liquidity, investment duration, and other comparability issues. In a recent survey of over 800 private landowners in Mississippi, for example, it was found that hurdle rates were higher for longer-term forestry investments than for shorter-term investments. In inflated, before-tax terms, hurdle rates averaged 13.1 % for 25-year forestry investments, 11.3% for 15-year forestry investments, and 8% for five-year forestry investments (Bullard et al. 2001).

Also, landowners may be willing to accept a lower hurdle rate for timber because they enjoy non-financial benefits from standing timber—aesthetics, wildlife habitat, and many other factors can be extremely important considera-

Why is the value of land included when you estimate the projected rate of value increase of a forested property?

Land value is included because land is needed to grow trees, and there are costs associated with owning (or renting) land for timber production. When we include land value in our financial maturity calculation, we recognize the "opportunity costs" associated with the land—the land and its value are "tied up" as long as we continue to grow the current stand of timber. If we only considered the value growth rate of the timber, we would ignore this cost and we would tend to hold the timber past the age of actual factual maturity.

What land value should you use?

The correct land value to use is the actual value of the land to you, the owner. If you would consider selling the land, for example, the value to use is the minimum value you would be willing to accept from a buyer. If you would consider selling the land, for example, the value to use is the minimum value you would be willing to accept from a buyer. If you plan to continue growing timber, meanwhile, you should use the value that the land has to you for growing subsequent stands of timber.

tions in timber harvest decisions. These considerations can be reflected by landowner's willingness to accept a reduced financial rate of return over the life of a particular stand of timber.

Summary

Financial maturity is a useful guide in helping decide whether to harvest timber now or wait a few more years. The usefulness of financial maturity as a decision making aid comes from its flexibility and simplicity. The approach is flexible because virtually any merchantable stand of timber can be evaluated, and because the landowner or forester can use any method available to project future volumes and prices. The

approach can be used for evaluating the projected growth and value of timber stands, or it can be used to assess historical rates of value increase. Financial maturity calculations are relatively simple, and the interest rate comparison is easy to understand and apply.

Finally, although beyond the scope of this article, financial maturity can be defended as a valid approach for maximizing landowner wealth from forested properties. Foresters use financial criteria that maximize wealth to set "optimal" or best rotation ages and financial maturity guides so harvest decisions ensure that landowner wealth from a property is maximized in decisions to harvest existing stands.



References and Sources of More Information
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Forest landowners can receive an example three-page set of financial maturity calculations by contacting Dr. Bullard at Box 9681, Mississippi State, MS 39762-9681. Tel. (662) 325-2781. e-mail: sbullard@cfr.msstate.edu.

A financial maturity "worksheet":

You'll need four numbers to evaluate the financial maturity of timber:

Value of the timber today _____

Projected value of the timber _____

Length of time (projection period) _____

Value of the land to the owner _____

Using these four numbers, first calculate the Forest Value Growth percent (FVG%), then compare this annual projected rate of return to hurdle rate of interest you've specified for the tract of timber being evaluated.

1. Calculate Forest Value Growth percent:

$$FVG\% = \left[\frac{\text{Projected Timber Value} + \text{Land Value}}{\text{Timber Value Today} + \text{Land Value}} \right] - 1$$

2. Compare FVG% to your hurdle rate—

FVG% vs. Hurdle Rate

If FVG% is less than the hurdle rate of return, the timber is "financially mature," or ready to harvest from a financial standpoint.



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